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NEW YORK STATE DEPARTMENT OF HEALTH

SMALLPOX QUESTIONS AND ANSWERS: The Disease and Vaccine

What should I know about smallpox?

Smallpox is an acute, contagious, and sometimes fatal disease caused by an orthopoxvirus and marked by fever and a distinctive progressive skin rash. In 1980, the disease was declared eradicated following worldwide vaccination programs. However, in the aftermath of the events of September and October, 2001, New York State, along with other states, and the U. S. government are taking precautions to be ready to deal with a bioterrorist attack using smallpox as a weapon. As a result of these efforts: 1) There is a detailed nationwide smallpox preparedness program to protect Americans against smallpox as a biological weapon. This program includes the creation of preparedness teams that are ready to respond to a smallpox attack on the United States. Members of these teams – health care and public health workers – are being vaccinated so that they might safely protect others in the event of a smallpox outbreak. 2) There is enough smallpox vaccine to vaccinate everyone who would need it in the event of an emergency.

How serious is the smallpox threat?

The deliberate release of smallpox as an epidemic disease is now regarded as a possibility, and the United States is taking precautions to deal with this possibility.

How dangerous is the smallpox threat?

Smallpox is classified as a Category A agent by the Centers for Disease Control and Prevention. Category A agents are those that pose the greatest potential threat for adverse public health impact and have a moderate to high potential for large-scale dissemination. The public is generally more aware of category A agents, and broad-based public health preparedness efforts are underway. Other Category A agents are anthrax, plague, botulism, tularemia, and viral hemorrhagic fevers.

If I am concerned about a smallpox attack, can I go to my doctor and get the smallpox vaccine?

At the moment, the smallpox vaccine is not available for members of the general public. In the event of a smallpox outbreak, however, there is enough smallpox vaccine to vaccinate everyone who would need it.

THE DISEASE

What are the symptoms of smallpox?

The symptoms of smallpox begin with high fever, head and body aches, and sometimes vomiting. A rash follows that spreads and progresses to raised bumps and pus-filled blisters that crust, scab, and fall off after about three weeks, leaving a pitted scar.

If someone comes in contact with smallpox, how long does it take to show symptoms?

After exposure, it takes between 7 and 17 days for symptoms of smallpox to appear (average incubation time is 12 to 14 days). During this time, the infected person feels fine and is not contagious.

Is smallpox fatal?

The majority of patients with smallpox recover, but death may occur in up to 30% of cases.

How is smallpox spread?

Smallpox normally spreads from contact with infected persons. Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Indirect contact is not common. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Smallpox is not known to be transmitted by insects or animals.

How many people would have to get smallpox before it is considered an outbreak?

One suspected case of smallpox is considered a public health emergency.

Is smallpox contagious before a rash appears?

A person with smallpox is sometimes contagious with onset of fever (prodrome phase), but the person becomes most contagious with the onset of rash. Patients remain infectious until the last scab falls off.

Is there any treatment for smallpox?

Smallpox can be prevented through use of the smallpox vaccine, even if the vaccine is given within three days after exposure to smallpox. There is no proven treatment for smallpox, but research to evaluate new antiviral agents is ongoing. Preliminary results with the drug, cidofovir suggest it may be useful. (The use of cidofovir to treat smallpox or smallpox vaccine reactions should be evaluated and monitored by experts at NIH and CDC.) Patients with smallpox can benefit from supportive therapy (e. g., intravenous fluids, medicine to control fever or pain) and antibiotics for any secondary bacterial infections that may occur.

THE VACCINE

What is the smallpox vaccine, and is it still required?

The smallpox vaccine is the only way to prevent smallpox. The vaccine is made from a virus called vaccinia, which is another pox-type virus related to smallpox. The vaccine helps the body develop immunity to smallpox. It was successfully used to eradicate smallpox from the human population.

Routine vaccination of the American public against smallpox stopped in 1972 after the disease was eradicated in the United States. Until recently, the U. S. government provided the smallpox vaccine only to a few hundred scientists and medical professionals who work with smallpox and similar viruses in a research setting. After the events of September and October, 2001, however, we have taken extensive actions to improve our level of preparedness against terrorism. For smallpox, this included updating a response plan and ordering enough smallpox vaccine to immunize the American public in the event of a smallpox outbreak. The plans are in place, and there is sufficient vaccine available to immunize everyone who might need it in the event of an emergency.

Should I get vaccinated against smallpox?

The smallpox vaccine is not available to the general public at this time. If vaccination is considered advisable, you will be notified quickly.

How is the vaccine given?

The smallpox vaccine is not given with a hypodermic needle. It is not a shot, like many vaccinations. The vaccine is given using a bifurcated (two-pronged) needle that is dipped into the vaccine solution. When removed, the needle retains a droplet of the vaccine. The needle is then used to prick the skin 15 times in a few seconds. The pricking is not deep, but it will cause a sore spot and one or two drops of blood to form. The vaccine usually is given in the upper arm.

If the vaccination is successful, a red and itchy bump develops at the vaccination site in three or four days. In the first week after vaccination, the bump becomes a large blister, fills with pus, and begins to drain. During week two, the blister begins to dry up and a scab forms. The scab falls off in the third week, leaving a small scar. People who are being vaccinated for the first time have a stronger reaction than those who are being revaccinated.

If someone is exposed to smallpox, is it too late to get a vaccination?

Vaccination within 3 days of exposure will completely prevent or significantly modify smallpox in the vast majority of persons. Vaccination 4 to 7 days after exposure likely offers some protection from disease or may modify the severity of disease.

How long does a smallpox vaccination last?

Past experience indicates that the first dose of the vaccine offers protection from smallpox for 3 to 5 years, with decreasing immunity thereafter. If a person is vaccinated again later, immunity lasts longer.

Are diluted doses of smallpox vaccine as effective?

Recent tests have indicated that diluted smallpox vaccine is just as effective in providing immunity as full-strength vaccine.

VACCINIA

What is the smallpox vaccine made of?

The vaccine is made from a virus called vaccinia, another pox-type virus related to smallpox. The smallpox vaccine helps the body develop immunity to smallpox.

Is it possible for people to get smallpox from the vaccination?

No. The smallpox vaccine does not contain smallpox virus and cannot spread or cause smallpox. However, the vaccine does contain another virus called vaccinia which is live in the vaccine. Because the virus is alive, it can spread to other parts of the body or to other people from the vaccine site. For that reason, the vaccine site must be carefully monitored.

Is it possible to get vaccinia, the virus in the vaccine, from someone who has recently been vaccinated?

Yes. Vaccinia is spread by touching a vaccination site before it has healed or by touching bandages or clothing that have become contaminated with live virus from the vaccination site. Vaccinia is not spread through airborne contagion. The vaccinia virus may cause rash, fever, and head and body aches.

What are the symptoms of vaccinia?

The vaccinia virus may cause rash, fever, and head and body aches.

How is vaccinia spread?

Vaccinia is spread by touching a vaccination site before it has healed or by touching bandages or clothing that have become contaminated with live virus from the vaccination site. Vaccinia is not spread through the air.

VACCINE SAFETY

How safe is the smallpox vaccine?

The smallpox vaccine is the best protection you can get if you are exposed to the smallpox virus. Most people experience normal, usually mild reactions that include a sore arm, fever, and body aches. In recent tests, one in three people felt bad enough to miss work, school, or recreational activity or had trouble sleeping after receiving the vaccine. However, the vaccine does have some more serious risks. In the past, about 1,000 people for every 1 million people vaccinated experienced reactions that, while not life-threatening, were serious. These reactions include a vigorous (toxic or allergic) reaction at the site of the vaccination and spread of the vaccinia virus (the live virus in the smallpox vaccine) to other parts of the body and to other people. These reactions typically do not require medical attention. Rarely, people have had very bad reactions to the vaccine. In the past, between 14 and 52 people per 1 million vaccinated experienced potentially life-threatening reactions, including eczema vaccinatum, progressive vaccinia (or vaccinia necrosum), or postvaccinal encephalitis. Based on past experience, it is estimated that between 1 and 2 people out of every 1 million people vaccinated will die as a result of life-threatening reactions to the vaccine. Careful screening of potential vaccine recipients is essential to ensure that those at increased risk do not receive the vaccine. People most likely to have side effects are people who have, or even once had, skin conditions, (especially eczema or atopic dermatitis) and people with weakened immune systems, such as those who have received a transplant, are HIV positive, or are receiving treatment for cancer. Anyone who falls within these categories, or lives with someone who falls into one of these categories, should NOT get the smallpox vaccine unless they are exposed to the disease. Pregnant women should not get the vaccine because of the risk it poses to the fetus. Anyone who is allergic to the vaccine or any of its components should not get the vaccine, and anyone under the age of 18 should not get the vaccine unless they are exposed to smallpox.

Who should NOT get the vaccine?

People who should not get the vaccine include anyone who is allergic to the vaccine or any of its components (polymyxin B, streptomycin, chlortetracycline, neomycin); pregnant women; women who are breastfeeding; people who have, or have had, skin conditions especially eczema and atopic dermatitis); and people with weakened immune systems, such as those who have received a transplant, are HIV positive, are receiving treatment for cancer, are taking medications (like steroids) that suppress the immune system, or have heart conditions. Also individuals younger than 12 months of age should not get the vacccine. Additionally, the Advisory Committee on Immunization Practices (ACIP) advises against non-emergency use of smallpox vaccine in children younger than 18 years of age and the vaccine manufacturer's package insert states that the vaccine is not recommended for use in geriatric populations in non-emergency situations. The term geriatric generally applies to those people age 65 and above. These people should not receive the vaccine unless they have been exposed to smallpox. Also, people who are using steroid drops in their eyes should wait until they are no longer using the medication to get the vaccine.

Should I get the vaccine if I have heart problems?

Careful monitoring of smallpox vaccinations given over recent months has suggested that the vaccine may have caused side effects on the heart. There have been reports of heart pain (angina), heart inflammation (myocarditis), inflammation of the membrane covering the heart lining (pericarditis), and/or a combination of these two problems (myopericarditis). Experts are exploring this more in depth. As a precaution, if you have been diagnosed by a doctor as having a heart condition with or without symptoms you should NOT get the smallpox vaccine at this time. These include conditions such as known coronary disease and/or three or more of the following risk factors:

- You have been told by a doctor that you have high blood pressure.
- You have been told by a doctor that you have high blood cholesterol.
- You have been told by a doctor that you have diabetes or high blood sugar.
- You have a close relative (mother, father, brother, or sister) who had a heart condition before the age of 50.
- You smoke cigarettes now.

Is there any way to treat bad reactions to the vaccine?

Vaccinia Immune Globulin (VIG) can help people who have certain serious reactions to smallpox vaccine. A second drug, cidofovir, may be used is some situations. Neither drug is currently licensed for this purpose (both administered under investigational new drug (IND) protocol) and they may have side effects of their own.

Is a child under the age of 1 year in the household a contraindication to vaccination?

Vaccinated parents of young children need to be careful not to inadvertently spread the virus to their children. They should follow site care instructions that are essential to minimizing the risk of contact transmission of vaccinia. These precautions include covering the vaccination site, wearing a sleeved shirt, and careful hand washing anytime after touching the vaccination site or anything that might be contaminated with virus from the vaccination site. If these precautions are followed, the risk for children is very low. Individuals who do not believe that they can adhere to such instructions should err on the side of caution and not be vaccinated at this time.

Are there any eye conditions that would preclude vaccination?

The concern surrounding eyes is that frequent touching of the eyes by someone who has gotten the smallpox vaccine may increase the chances that that person will experience spread of the vaccinia virus to the eyes (inadvertent inoculation of the eye) by touching the vaccine site or something contaminated with live virus and then touching their eyes before they wash their hands. This side effect is a serious one because it can lead to damaged vision, or even blindness. People who wear contact lenses, or touch their eyes frequently throughout the day can get the smallpox vaccine, but they must be especially careful to follow instructions for care of the smallpox vaccination site. Frequent and thorough hand washing will minimize the chance of contact spread of the vaccinia virus. As an additional precaution to minimize the risk of this type of transmission in selected groups of people, the Advisory Committee on Immunization Practices (ACIP) decided that anyone with eye diseases or other conditions (e.g. recent LASIK surgery) that require the use of corticosteroid drops in the eye should wait until they no longer require such treatment before getting vaccinated.

FOR MORE INFORMATION, VISIT: www.health.state.ny.us

QUESTIONS? CALL (888) 246-2675 (English) • (888) 246-2857 (Español) • (866) 874-2646 (TTY)

or email to nyhealth@health.state.ny.us.

Source: Department of Health and Human Services, Centers for Disease Control and Prevention and New York State Department of Health